JUN 29, 06

(Rel.95—7/03 Pub.605) **FORM 19-4** 19-13

DIVISION

Practitioner's Docket No. VO-713 **PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

☒ In re **application of:**
Application No.: 10/519,766 Group No.:
Filed: 11 October 2005 Examiner:
For: Bernd SCHULTHEIS et al.
PRINTING DEVICE

☐ **Patent**#: Issued:

NOTE: Insert name(s) of inventor(s) and title also for patent. Where request is with respect to a maintenance fee payment also insert application number and filing date and add Box M. Fee to address.

Mail Stop 16
Director of the U.S. Patent and Trademark Office
P.O. Box 1450, Alexandria, VA 22313-1450

REQUEST FOR REFUND
(IMPROPER CHARGE OF DEPOSIT ACCOUNT)

NOTE: 37 C.F.R. § 1.26(b) "Any request for refund must be filed within two years from the date the fee was paid, except as otherwise provided in this paragraph or in § 1.28(a). If the Office charges a deposit account by an amount other than an amount specifically indicated in an authorization (§ 1.25(b)), any request for refund based upon such charge must be filed within two years from the date of the deposit account statement indicating such charge, and include a copy of that deposit account statement. The time periods set forth in this paragraph are not extendable."

I. REFUND REQUEST

This is a request for a refund, with respect to the charge to Deposit Account 19-3550, shown on the statement dated October 2005, for the above-identified

☒ application.

☐ patent.

I hereby certify that this correspondence (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop 16, Director of the U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 on
23 JUN 2006

23 JUN 2006
Date

Signature

III. EXPLANATION OF WHY CONTESTED CHARGE IS IN ERROR

On 22 December 2004, Applicants filed a verified English language translation of the International Application, including annexes to the International Preliminary Examination Report, in the subject U.S. Patent Application. A Transmittal Letter (Form PTO-1390), showing the priority date of 22 June 2002, was also filed. Both documents were filed on 22 December 2004 by Certificate of Mailing by Express Mail. The 30-month deadline for filing the above-referenced documents had not elapsed, thus no additional surcharge was due. A copy of the English language translation, the Transmittal Letter, the Certificate of Mailing by Express Mail, and the return receipt postcard is enclosed.

On 19 October 2005, Deposit Account No.19-3550 was charged by the U.S. Patent and Trademark Office under fee code no.1618 (English language translation after 30 months from priority date), for the subject U.S. Patent Application. A copy of the October 2005 Deposit Account Statement is enclosed. We believe that this fee was charged to our Deposit Account in error and request a refund of $130.00 to our Deposit Account No.19-3550.

IV. MANNER OF REFUND

Please make refund by

☒ crediting Account No. 19-3550

☐ crediting credit card as shown on the attached credit card information authorization form PTO-2038.

WARNING: Credit card information should not be included on this form as it may become public.

☐ refunding payment.

SIGNATURE OF PRACTITIONER

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PATENT AND TECHNICAL TRANSLATION

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ACCREDITED BY AMERICAN TRANSLATORS ASSOCIATION
* GERMAN AND FRENCH TO ENGLISH
** ENGLISH TO GERMAN

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December 7, 2004

DECLARATION

The undersigned, Olaf Bexhoeft, hereby states that he is well acquainted with both the English and German languages and that the attached is a true translation to the best of his knowledge and ability of the German text of PCT/EP2003/006090, filed on 06/11/2003, and published on 12/31/2003 under No. WO 2004/000565 A2, and of eighteen (18) amended claims.

The undersigned further declares that the above statement is true; and further, that this statement was made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent resulting therefrom.

Olaf Bexhoeft
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MAILED 22 December 2004

Printing Device

The invention relates to a printing device with an electro-photographic print unit, to which a transfer medium for transferring a toner powder to a substrate in a transfer zone is assigned, wherein the substrate can be conducted through the transfer zone by means of a transport system, wherein heat energy can be introduced into the substrate by means of one or several heating elements.

Such a printing device is known from USP 5,988,068. There, an endlessly revolving belt is assigned to an electro- photographic print unit as the transfer medium. A photoconductor rolls off on the belt for transferring an image consisting of toner powder. The toner image can be applied to a substrate. To this end, the substrate is moved past the transfer medium by means of a transport system. In this case the transfer medium rolls off the substrate surface to be imprinted. For improving the toner transfer, USP 5,988,068 proposes the employment of two heating elements. The first heating element heats the substrate to a temperature higher than 60°C. The second heating element acts on the transfer medium at a temperature higher than 100°C.

With this arrangement it has been found to be disadvantageous, in particular in connection with printing with ceramic toners, that residue from the toner adheres to the transfer medium which, because of the doughy consistency, is hard to remove at this temperature, or cannot be completely removed. Moreover, during constant operation, heat is introduced into the electro-photographic print unit via the transfer medium. This results in the worsening of the image quality.

It is the object of the invention to create a printing device of the type mentioned at the outset, by means of which an improved toner transfer from the transfer medium to the substrate is possible.

This object is attained in that a cooling device is assigned to the transfer medium, which removes heat from the latter. Because of the cooling of the transfer medium it is assured that the toner powder does not adhere to the surface of the transfer medium after the transfer to the substrate has been completed, but instead is released almost completely during the transfer. The introduction of heat into the print unit, in particular at the sensitive photoconductor, is also prevented by the cooling, or is at least minimized to an acceptable degree.

In accordance with a preferred embodiment variation of the invention it has been provided that at the transfer zone formed with the substrate, the transfer medium has a lower temperature, at least in the area of the contact face, than the surface of the substrate. It has then been assured that the flow of heat can take place at most from the substrate to the transfer medium. Then the cooling device removes this heat in a controlled manner, at least in the greatest part.

In accordance with the invention it can be provided that the cooling device cools the temperature of the transfer medium to a temperature $\leq$ 60°C. The temperature preferably is less than 40°C. At these temperatures the transfer medium is not heated, even during constant operation, in such a way that the toner powder reacts with the surface of the transfer medium. The toner transfer can be additionally aided in that the toner transfer in the transfer zone can be affected by means of one or several coronas. In the course of this,

electrostatic forces act on the toner powder. For example, it is possible to arrange coronas over large areas upstream and/or downstream of the transfer zone. These then charge the substrate. Alternatively, or additionally, the substrate can also be placed on a conductive base. In contrast to negatively charged toners, the latter is then positively charged. With positively charged toners then correspondingly negatively. The charge voltages can be reduced in an advantageous manner in such a way that negative field effects, such as with an exclusive toner transfer created by means of electrostatic fields, no longer occur.

An additional improvement of the toner transfer can be achieved in that on its surface which receives the toner powder the transfer medium is provided with an anti-adhesive layer, and that this anti-adhesive layer has a surface energy within the range of 15 mN/m to 30 mN/m.

It would be conceivable to use a Teflon coating within the range of 18 to 20 mN/m. In this case the anti-adhesive layer should have a layer thickness in a range between 1 and 100 µm, preferably 5 to 50 µm. A particularly effective heating of the substrate can take place in that the substrate can be charged with heat energy by means of a heating element designed as an infrared radiator and/or a hot air blower and/or by means of the application of a flame. The substrate should be heated in a temperature range between 80°C and 200°C. In a preferred manner, the surface temperature of the substrate in the coating area has been set to more than 100°C to 170°C. In this case, the temperature should be set as a function of the toner used. Tests with ceramic toners having a solids component (pigments, glass frit) of 50 to 70% have shown that a surface temperature of the substrate of 120°C to 150°C is particularly advantageous. Following the conclusion of the transfer, the